

Notice of Allowability

Application No.

10/737,071

Examiner

Evan Pert

Applicant(s)

CHO ET AL.

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the application filed December 15, 2003.
2. ☒ The allowed claim(s) is/are 1-18.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 1203
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows, *to place the application in better form without altering the intended scope of the originally filed claims:*

In the abstract, line 2, change "consumptions" to --consumption--.

In the abstract, line 4, change "which is disposed opposite" to --which is laterally disposed adjacent--.

In the abstract, line 5, change "located contacts" to --located between and contacting--.

At p. 1, line 18, change "difference resulted from a phase-change, practically data is stored on" to --difference from a phase-change, data is stored as a characteristic of--.

At p. 1, line 21, change "region then," to --region. Then,".

At p. 2, line 1, change "writing" to --a writing--.

At p. 2, line 2, change "phase that" to --phase; that--.

At p. 2, line 8, delete "so that capable for".

At p. 2, line 11, change "insulation condition" to --isolation--.

At p. 3, line 12, change "in side direction" to –in a sideways direction (i.e. the first and second electrodes are laterally disposed adjacent one another with a gap between a side surface of the first electrode and a side surface of the second electrode)--.

In claim 1, line 3, change "whose side surface faces a side surface of the first electrode in side direction" to –laterally disposed adjacent to the first electrode, wherein a side surface of the first electrode faces a side surface of the second electrode--.

In claim 1, line 6, change "and is made" to –and made--.

In claim 3, line 2, change "of one" to --of a material--.

In claim 5, line 2, change "has narrow" to –has a narrow--.

In claim 7, line 2, change "with its two opposite surfaces contact" to –with two opposite surfaces contacting--.

In claim 10, line 5, change "that dividing" to –dividing--.

In claim 10, line 6, change "sidely is" to –is laterally--.

In claim 11, line 6, change "has narrower" to –has a narrower--.

In claim 11, line 7, change "to cross secting the" to –through the--.

In claim 11, line 8, change "cross sected surface" to –exposed surface--.

In claim 11, line 9 after "layer" insert –at the contact hole wall--.

In claim 16, line 3, change "above contact" to –perimeter of the contact--.

Allowable Subject Matter

2. Claims 1-18 are allowed.
3. The following is an examiner's statement of reasons for allowance:

Applicant's invention is distinguishable from prior art by the claimed configuration of "first" and "second" electrodes that are used for programming a "memory layer," the first and second electrodes being disposed laterally (i.e. laterally relative to a substrate supporting the first and second electrodes), and wherein the memory layer is disposed between side surfaces of the first and second electrodes respectively.

The meaning of "side" surfaces of an electrode, by applicant's *written description*, is the designation of surfaces that traverse the thickness of a deposited and/or patterned layer that forms the electrode, such that a "side" is also "perpendicular" to a substrate surface supporting the electrode, the electrode material necessarily extending more in a lateral direction (i.e. a direction perpendicular to a side of the electrode and parallel to the supporting substrate) than in a vertical direction (i.e. a direction parallel to a side of the and perpendicular to the supporting substrate).

Applicant somewhat unconventionally, yet acceptably by *written description*, deems the first electrode as a "for heating" which is applicable for programming the memory layer (e.g. chalcogenide). However, the "heating" from the first electrode actually occurs in conjunction with the second electrode by an electrical current passing between first and second electrodes, wherein current density for programming is greater near the first electrode causing "heating" more at the first electrode. The first electrode is not an electrical heater by itself, yet is used "for heating" (i.e. for heating by passing a current from the electrode to the memory layer).

Applicant's invention advantageously utilizes the "sides" of a pair of electrodes for passing a programming current through a memory layer. By using the sides of two laterally disposed electrodes for programming, a region of contact to the memory layer can be controlled by controlling electrode thickness and contact hole patterning.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

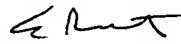
4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan Pert whose telephone number is 571-272-1969. The examiner can normally be reached on M-F (7:30AM-3:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ETP
October 28, 2005


EVAN PERT
PRIMARY EXAMINER